

## **REMARKS**

### **With regard to the drawings:**

It is now believed that the revised drawing sheet where the erroneous numeral 3 has been eliminated from Fig. 4 will remove the objection to the drawings.

### **With regard to the claims:**

A new set of claims is submitted herewith taking into consideration all of the Claim Objections and Claim Rejections presented in the Office Action.

### **With regard to the objections to Claims 1, 2 and 6 under 35 USC § 103 for obviousness:**

The main claim has been extensively revised to more clearly delineate what the invention is and distinguish it over the prior art. It is now more clearly stated that the present system is for joining at least first and second beams of *rectangular cross section*. The system is only designed for such rectangular beams. The system permits the flat backside of each fixing plate to be easily fitted to the flat backside of another fitting plate, using locking elements (cylindrical sleeves in recesses in the fixing plates) to position the plates, and thus the beams, perpendicularly or in parallel to each other. The locking elements, after being used to locate the plates correctly in relation to each other, are then used as anchoring elements with bolts to fasten the plates to the beam and to each other.

The fastening plates in the system of the invention are completely interchangeable and securely fasten any number of beams to each other in a secure structure, which can be disassembled leaving the beams entirely intact with no holes or notches whatsoever. If the bolts are attached but not completely tightened down, it is possible to easily adjust the longitudinal position of the beam by sliding it into the desired position between the plates before tightening down the plates. These significant and surprising advantages are in no way available in any of the cited prior art.

### **US 4 901 970 (*Moss*) visavi the amended Claim 1:**

*Moss* discloses a system for attaching a fishing rod-holding cylinder (10) via a hexagonal boss 12 bolted to a hole drilled into the cylinder (10), using a bolt (18) which also holds the bottom part 32 of a clamp to be attached to the rail of a fishing boat. There are distinct and important differences between the disclosure of *Moss* and the system as now defined in the amended Claim 1. Specifically *Moss* does not appear to disclose or hint at a system for detachable joining of first and second beams of rectangular cross-section. It addresses a completely different problem and shows a different construction. There is only a pair of clamps (not plates) designed to clamp the fishing boat rail (50), another pair of clamps being completely lacking. Interconnectibility between identical pairs of fixing plates, to build a box-beam structure, is the whole point of the present invention.

It is true that US 5 873 564 (*Bisch*) discloses a system for connecting metal tubes of rectangular cross-section, but which has all the disadvantages of other prior art systems which the present invention removes, i.e. destructive holes for joining, non-adjustability, a construction which cannot be disassembled etc. Fig. 8 shows a known type of fastener comprising a bolt (48) and a threaded sleeve (58).

There is, however, no way to combine *Moss* and *Bisch* to arrive at the system as defined in the amended Claim 1.

### US 4 597 960 (*Girard*) in combination with *Moss*

The invention by Mr Girard US Patent no 4, 597,960 is using clamping elements (11) fig 1, which, being generally rectangular, bear a passing resemblance to the fixing plates (1), Fig 1 of the present invention. An important difference is however that in the present invention as defined in the new claims, locking elements (6, 13) are placed in recessions (10), fig 2 of the fixing plates forming extraordinarily strong and stiff joints of two clamps mounted to each other as is illustrated in fig 1. Girard discloses no joining whatsoever of two pairs of clamping elements, back to back as in the present invention. Indeed the clamps of Girard use an old method with a bolt through the center of the clamping plate to clamp it to a hollow open rail (see Fig. 5) not a solid box beam as in the present invention.

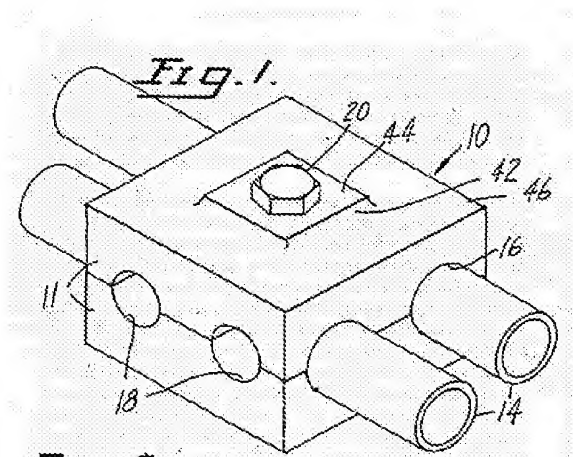


Fig 1 of Mr Girard's patent

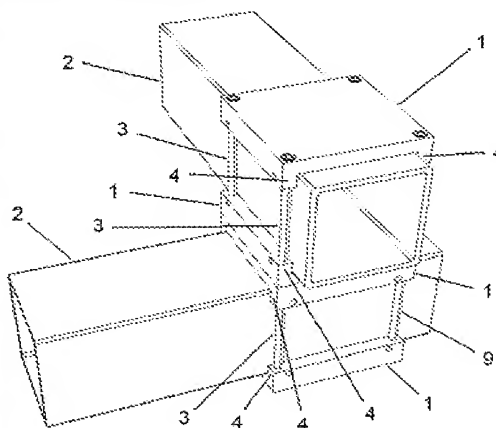


Fig 1 of the present patent application

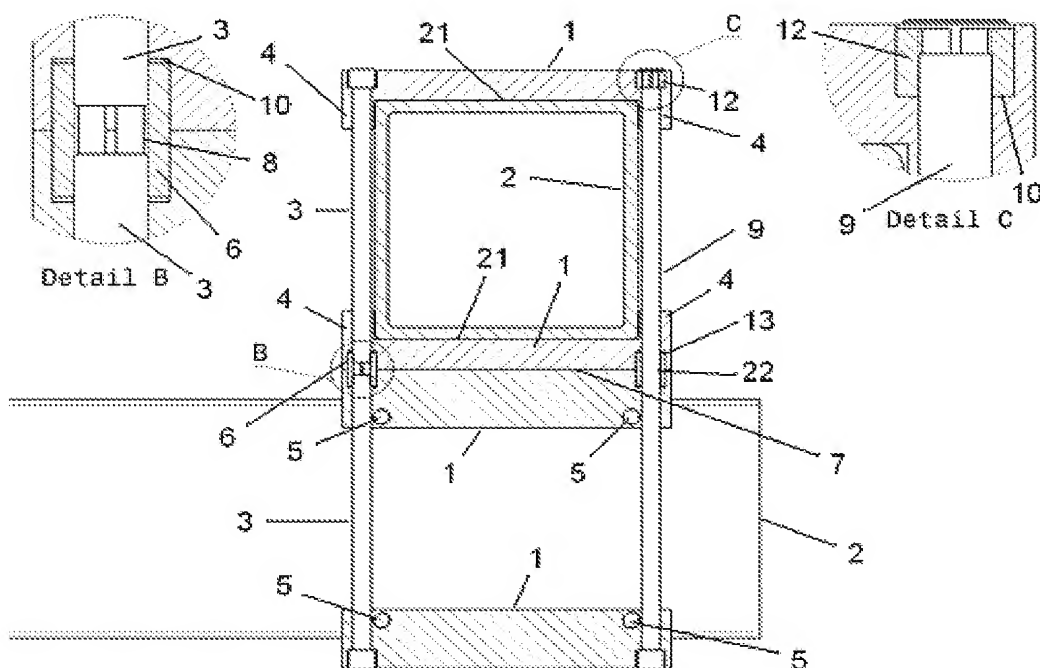


Fig 2 of present patent application

The different embodiments of Mr Girard's invention enables the clamping of tubes to a strut Fig 5 or to a wall indicated in Fig 9, by means of bolts (20).

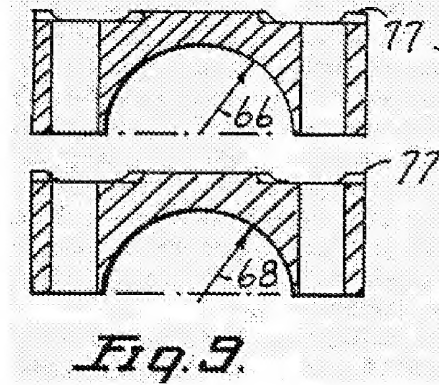
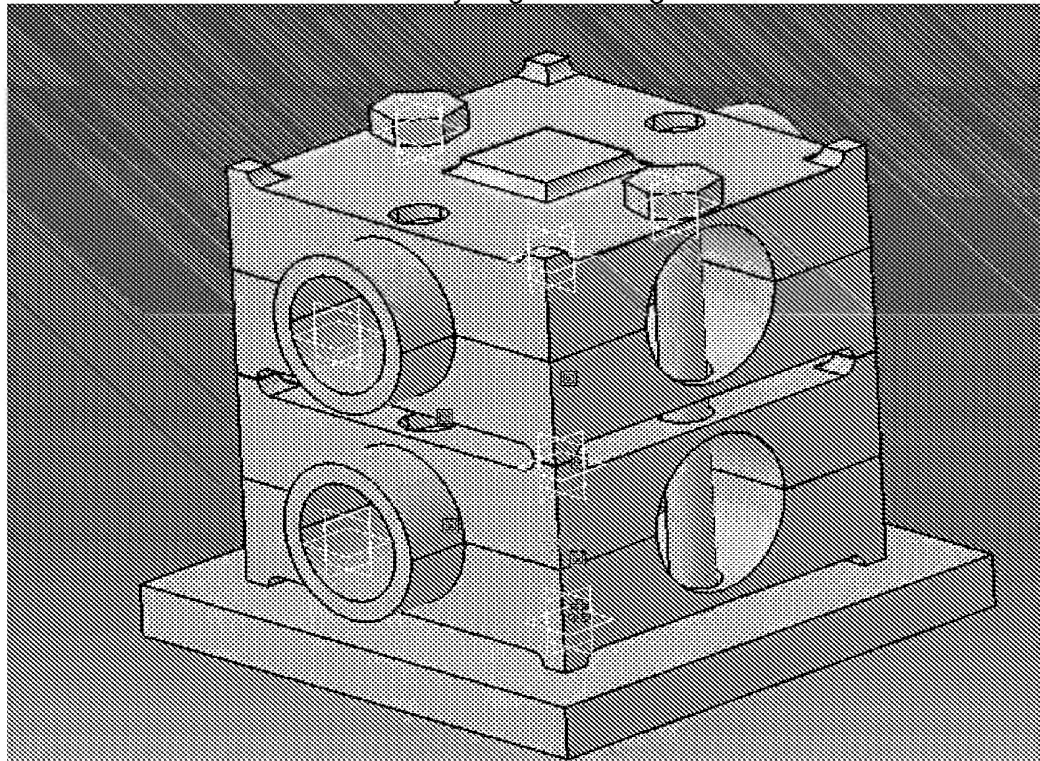


Fig 9 of Mr Girards patent

As can be seen from Fig 9, small corner bosses (77) might be used to stabilise a clamping element in relation to a flat surface. Girard makes no mention of combining clamps back to back, but if one were to make a hypothetical hindsight combination of two clamps according to Girard to attempt to arrive at the present invention, the flat surfaces of the bosses (77) might stabilize the clamps if two clamps were placed on top of each other, counter to any indication of Girard. This kind of stack assembly might be imagined as illustrated below.

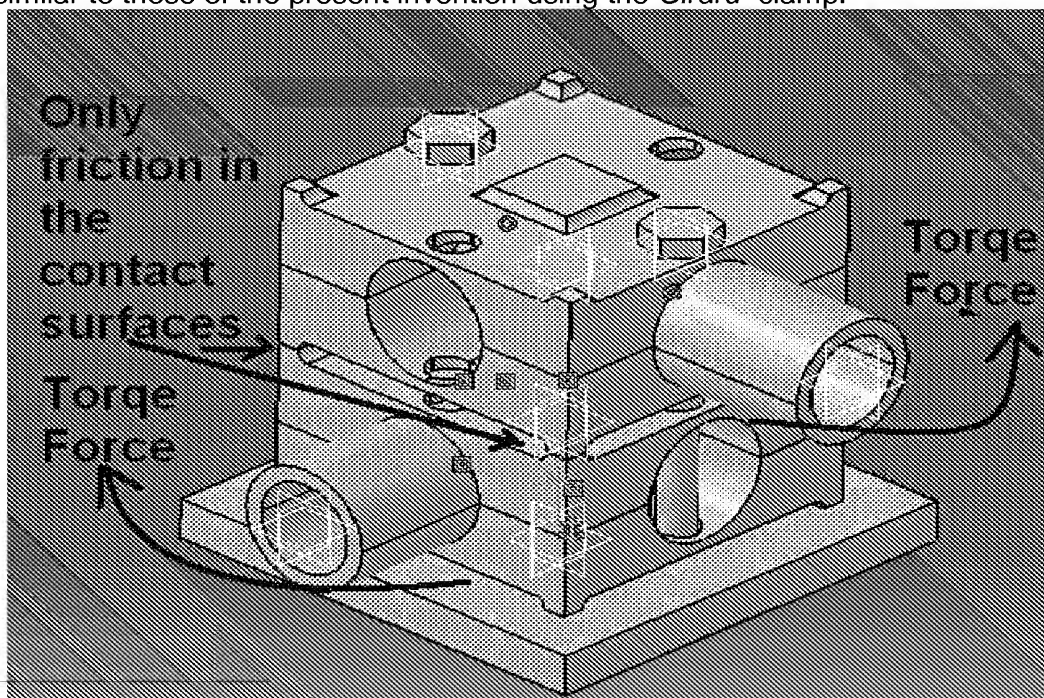


Imagined illustration of the *Girard* clamp when used in a stack assembly.

One can see that the two tubes might be clamped in parallel relative to each other by means of the bolts pressing the stack of four clamping elements together. The bolts, in this kind of conceived assembly, are extended to go through the complete stack.

Although the principles of the *Girard* clamps probably will have good functionality in their intended applications, which is for tube clamps employed to secure tubes to open rails or walls, they will not function in the applications intended for my invention. The present invention is applied to high performance static frameworks where beams of steel with square or rectangular sections are to be configured in different perpendicular and parallel structures.

A first problem will occur when tubes according to the principles of Mr Girard's invention are to be mounted perpendicular to each other as illustrated below. One of the tubes then will be penetrated by the two bolts pressing the stack of clamping elements together. This will severely weaken the tube and makes it impossible or difficult to reuse or adjust the configuration of the assembled structure. It is thus impossible to achieve effects and advantages similar to those of the present invention using the *Girard* clamp.



A second problem with the hypothetical use of stacked *Girard* clamps is that the stiffness of the joint will be insufficient when the beams, as illustrated above, are subjected to torque. The torque then will be transferred to the contact faces of the corner bosses (77) where only friction forces, which normally are relatively low, will counteract the torque in addition to the resistant forces of the bolts, which will have some clearance in their holes. This would result in slip movements in the contact plane, which are not acceptable in high performance frameworks.

With the present invention, locking elements (6, 13) are placed in recessions of the fixing plates, giving a secure and very capable geometrical locking between the two locking plates placed in between the two beams. Furthermore, the locking elements are shaped to act as

threaded anchors for contracting bolts working from two sides as illustrated on the left side of Fig 2 of my application. Alternatively the locking elements are shaped to enable extra long contracting bolts to pass through the locking elements as illustrated on the right side of Fig 2.

Thus even an unsuggested hypothetical stacking of *Girard* clamps would not result in any usable construction for the person skilled in the art.

A major problem involved in *each of the prior art references* is that they all require penetration of one of the tubes or beams by a bolt, which severely weakens the beam and makes it impossible or difficult to reuse or adjust the configuration of the assembled structure. The hypothetical use of such a construction for beams of rectangular cross section would be even more problematic from a structural failure standpoint.

### **Conclusion**

None of the cited references even approaches the idea of the invention nor do any of them reveal structures which could be combined with features of another reference to produce the present system as now defined in the amended main claim.

In the event there are any questions concerning this Amendment, or the application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of the application may be expedited.

No additional fees in addition to the fee for the Request for Continued Examination are believed to be due at this time however if necessary to effect a timely response the Commissioner is authorised to deduct the necessary fees from Deposit account No. 501249.

Respectfully submitted,

/Timothy Platt/

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Date: 29 January 2008